

Appl. No.: 09/841,713
Amdt. Dated: July 25, 2005
Off. Act. Dated: March 25, 2005

AMENDMENTS TO THE CLAIMS:

1. (currently amended): A headset for providing selective acoustical isolation to the wearer, comprising:

- (a) an earpiece capable of being positioned proximal the ear of a person wearing said apparatus;
- (b) an audio conversion device within the earpiece that is positioned so as to be acoustically coupled to the ear canal of said wearer, said audio conversion device configured to receive electrical energy and convert it to sound;
- (c) a microphone attached to said earpiece and configured to register the energy of sounds which occur external to the earpiece and to convert the sound energy to an external sound signal;
- (d) a selection device attached to said headset capable of being activated by the headset wearer; [[and]]
- (e) a signal conditioning circuit configured to sufficiently amplify and couple the external sound signal to the audio conversion device in response to activation of the selection device such that the headset enters a hearthrough mode which improves the ability of the wearer to hear external sounds; and
- (f) a timing mechanism within the headset that automatically deactivates the selection device a predetermined period of time after activation.

2. (Canceled)

3. (original): A headset as recited in claim 1, wherein the selection device comprises a switch activated by contact by the wearer.

4. (currently amended): A headset as recited in claim 1, wherein the headset is configured to receive input signals which are coupled to the audio conversion device, such that allowing the wearer [[may]] to listen to programming, including such as music

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[[and]] and/or audio communications that are received within the input signals.

5. (original): A headset as recited in claim 4, wherein the signal conditioning circuit is further configured to attenuate the input signals upon the activation of the selection device so as to improve the ability of the wearer to hear the external environment.

6. (original): A headset as recited in claim 5, wherein the level of attenuation comprises a muting of the input source by at least 20 dB.

7. (original): A headset as recited in claim 1, wherein the signal conditioning circuit comprises a signal processing unit which is further configured to compare the sounds registered by the microphone against a set of stored sound selection criterion, whereupon while the selection device remains inactive and in response to the signal processing circuit discerning a sufficient level of sound matching it conditions and couples the sound registered by the microphone to the audio conversion device within the earpiece such that the ability of the wearer to hear external sounds is responsive to the detection of selected sounds.

8. (currently amended): An apparatus for providing selective acoustical isolation to the wearer, comprising:

(a) an earpiece configured for positioning proximal the ear of a person wearing said apparatus and as a result providing a given number of decibels of acoustical isolation from the external environment;

(b) an audio conversion device within the earpiece that is positioned so as to be acoustically coupled to an ear canal of said wearer, said audio conversion device configured to receive an electrical signal which is converted to sound;

(c) a microphone attached to said earpiece that is configured to register the

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acoustical energy of external environmental sounds which are converted to an external sound signal; and

(d) a signal processing circuit configured to receive the external sound signal from said microphone which is compared against a set of programmed sound selection criterion, whereupon the amount of acoustic isolation provided by the apparatus is changed in response to a sufficient level of sound matching thereof;

wherein said signal processing circuit is configured for generating an alerting signal to the audio conversion device to signal the wearer that a sufficient sound match has occurred.

9. (original): An apparatus as recited in claim 8, wherein the change in the amount of acoustic isolation occurs for a sufficient period of time to alert the wearer of conditions in the external environment.

10. (currently amended): An apparatus A-headset as recited in claim 8, further comprising a manually operated selection device mounted on the apparatus which upon activation triggers a reduction in the amount of acoustical isolation provided by the apparatus.

11. (currently amended): An apparatus as recited in claim 8, wherein said audio conversion device is configured for receipt and conversion of a received program signal , such as containing music or communications, to audio for listening by the wearer.

12. (currently amended): An apparatus as recited in claim 8, wherein the signal processing circuit is configured to record external sounds sound characterizations as registered by said microphone as programmed sounds sound selection criterion upon user activation of characterization recording in approximate temporal synchronization with sounds from the external environment which whose sound characteristics are to be

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programmed into memory.

13. (currently amended): An apparatus as recited in claim 8, wherein the signal processing circuit is configured to allow the user to select programmed sounds ~~sound selection criterion~~ from a preprogrammed set of ~~sound selection criterion~~ sounds against which said sound matching is performed.

14. (original): An apparatus as recited in claim 8, wherein the set of programmed sounds comprise characterization information about sounds, referred to as hearthrough sounds, which the listener should be alerted to in response to their occurrence within the external environment, wherein in response to a sufficient level of sound matching between the sounds from the external environment and the hearthrough sounds the acoustical isolation of the apparatus is decreased by applying the external sound signal registered by the microphone to the audio conversion device to reproduce external sounds within the earpiece.

15. (currently amended): An apparatus as recited in claim 14, wherein said audio conversion device is configured for receipt and conversion of a received program signal, such as comprising music [[or]] and/or communications, with said program signal being attenuated in response to sufficient matching of the hearthrough sound with sounds registered from the external environment toward improving ~~such that~~ the ability of the wearer to listen to the external environment ~~is improved~~.

16 Canceled.

17. (original): An apparatus as recited in claim 8, wherein the signal processing circuit is configured with noise cancelation circuitry to enhance the earpiece acoustical isolation by modifying the output from the audio conversion device with a

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negative feedback, opposing phase, signal based on sounds registered by the microphone.

18. (original): An apparatus as recited in claim 17, wherein the set of programmed sounds comprise characterization information about sounds, referred to as hearthrough sounds, which the listener should be alerted to in response to their occurrence within the external environment, and wherein the signal processing circuit is configured to reduce the acoustic isolation provided by the noise cancelation circuitry after a hearthrough sound is sufficient matched with a sound from the external environment so as to improve the ability of the wearer to hear the external environment.

19. (original): An apparatus as recited in claim 17, wherein the noise cancelation circuitry is configured to selectively increase acoustical isolation provided by the headset of sound characterization elements contained within the set of programmed sound selection criterion that specify sounds which are to be blocked from the external environment, referred to as a blocked sound, wherein the noise cancelation circuitry specifically enhances its active attenuation of blocked sounds as received from the external environment.

20. Canceled.

21. (new): An apparatus for providing acoustic isolation to a wearer while acoustically responding to select environmental sounds, comprising:

(a) an earpiece configured for positioning proximal the ear of a person wearing said apparatus and as a result providing a number of decibels of acoustical isolation from the external environment;

(b) an audio conversion device within the earpiece that is positioned so as to be acoustically coupled to one or both ear canals of a person wearing said apparatus;

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wherein said audio conversion device is configured to receive an electrical signal which is converted to sound;

(c) a microphone attached proximal one or both earpieces and configured to register the acoustical energy of external environmental sounds which are converted to an external sound signal; and

(d) a signal processing circuit configured to receive the external sound signal from said microphone and compare it against a set of preprogrammed and/or user programmed sounds stored within memory and for generating an alerting audio signal to the wearer, or for modulating the level of acoustic isolation provided by the apparatus, or both, in response to detecting a sufficient level of matching between the sound registered by the microphone and the sound stored in memory.

22. (new): An apparatus as recited in claim 21:

wherein the sounds stored in memory comprise representations of sounds which are to be blocked, which the listener should be isolated from hearing when they occur within the external environment; and

wherein the signal processing circuit is configured to increase the acoustic isolation in response to sufficiently matching a sound from the external environment with representations of sounds which are to be blocked as stored in said memory, toward increasing active attenuation of unwanted sounds as received from the external environment.

23. (new): An apparatus as recited in claim 21:

wherein the sounds stored in memory comprise hear-through sounds, which the listener should be alerted to in response to their occurrence within the external environment; and

wherein the signal processing circuit is configured to reduce the acoustic isolation in response to sufficiently matching a hear-through sound from the external

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environment with a hear-through sound stored in said memory, toward improving the ability of the wearer to hear the external environment.

24. (new): An apparatus as recited in claim 21:

wherein said an audio conversion device is coupled to an electrical source of incoming audio signals for reproducing music or communications over said audio conversion device; and

wherein said signal processing circuit is further configured to attenuate incoming audio signals in response to detecting a sufficient level of matching between the sound registered by the microphone and the sound stored in memory.

25. (new): An apparatus as recited in claim 21:

wherein said alerting audio signal is generated as a user alert tone, or by replaying the matching sound, or a combination thereof, in response to detecting said sufficient level of matching between said external sound signal and recorded sounds stored within memory; and

wherein said matching sound is replayed by generating the temporally displaced detected external sound, or by generating the recorded sound stored within memory, or a combination of external and recorded sounds.